



Linking the oceans to public health: Current efforts and future directions

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Abstract:

We review the major linkages between the oceans and public health, focusing on exposures and potential health effects due to anthropogenic and natural factors including: harmful algal blooms, microbes, and chemical pollutants in the oceans; consumption of seafood; and flooding events. We summarize briefly the current state of knowledge about public health effects and their economic consequences; and we discuss priorities for future research. We find that: There are numerous connections between the oceans, human activities, and human health that result in both positive and negative exposures and health effects (risks and benefits); and the study of these connections comprises a new interdisciplinary area, "oceans and human health." The state of present knowledge about the linkages between oceans and public health varies. Some risks, such as the acute health effects caused by toxins associated with shellfish poisoning and red tide, are relatively well understood. Other risks, such as those posed by chronic exposure to many anthropogenic chemicals, pathogens, and naturally occurring toxins in coastal waters, are less well quantified. Even where there is a good understanding of the mechanism for health effects, good epidemiological data are often lacking. Solid data on economic and social consequences of these linkages are also lacking in most cases. The design of management measures to address these risks must take into account the complexities of human response to warnings and other guidance, and the economic tradeoffs among different risks and benefits. Future research in oceans and human health to address public health risks associated with marine pathogens and toxins, and with marine dimensions of global change, should include epidemiological, behavioral, and economic components to ensure that resulting management measures incorporate effective economic and risk/benefit tradeoffs.

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Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Health Professional, Researcher

Climate Change and Human Health Literature Portal

Early Warning System: ☒

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☒

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Food/Water Quality, Food/Water Quality, Food/Water Security, Precipitation, Sea Level Rise

Extreme Weather Event: Flooding, Hurricanes/Cyclones

Food/Water Quality: Biotoxin/Algal Bloom, Biotoxin/Algal Bloom, Chemical, Pathogen, Other Water Quality Issue

Water Quality (other): Nutrients; Ocean temperature

Food/Water Security: Nutritional Quality

Geographic Feature: ☒

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location: ☒

resource focuses on specific location

Global or Unspecified

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Cancer, Dermatological Effect, Developmental Effect, Infectious Disease, Injury, Mental Health/Stress, Morbidity/Mortality, Neurological Effect, Respiratory Effect

Developmental Effect: Cognitive/Neurological

Infectious Disease: Foodborne/Waterborne Disease, Vectorborne Disease

Foodborne/Waterborne Disease: Campylobacteriosis, Cholera, Cryptosporidiosis, General Foodborne/Waterborne Disease, Salmonellosis, Shigellosis

Foodborne/Waterborne Disease (other): Gastrointestinal illness

Vectorborne Disease: General Vectorborne, Mosquito-borne Disease

Mosquito-borne Disease: Malaria, West Nile Virus, Other Mosquito-borne Disease

Mosquito-borne Disease (other): Encephalitis, general

Mental Health Effect/Stress: Mood Disorder, Stress Disorder

Respiratory Effect: Asthma

Medical Community Engagement:

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Cost/Economic, Methodology

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Children, Elderly, Pregnant Women, Racial/Ethnic Subgroup

Other Racial/Ethnic Subgroup: Indigenous populations

Other Vulnerable Population: Immunocompromised; Pre-existing medical conditions

Resource Type:

format or standard characteristic of resource

Review

Resilience:

capacity of an individual, community, or institution to dynamically and effectively respond or adapt to shifting climate impact circumstances while continuing to function

A focus of content

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content